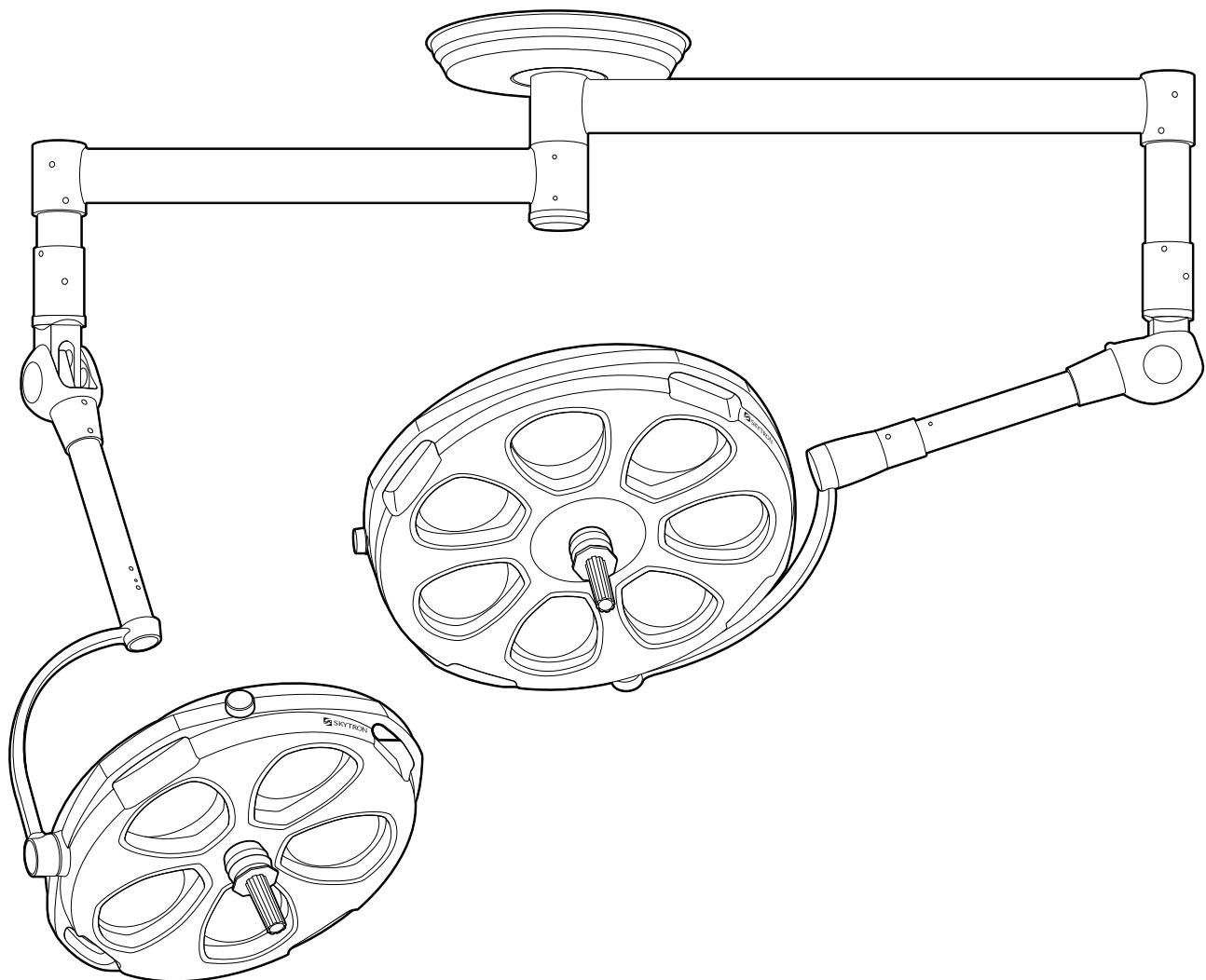


## OPERATORS MANUAL



**STELLAR**  
**SERIES SURGICAL LIGHTS**



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**REV. 8/05**

Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice.



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EQUIPMENT LABELS AND SPECIFICATIONS

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ATTENTION, CONSULT MANUAL FOR FURTHER INSTRUCTIONS.  
INDICATES SPECIAL USER ATTENTION.



AC VOLTAGE



FUSE TYPE 3 AMP, SLOW BLOW TYPE



FUSE TYPE 5 AMP, SLOW BLOW TYPE



CLASS I DEFIBRILLATION PROOF, TYPE B EQUIPMENT- IPX4 RATED.  
INTERNALLY POWERED EQUIPMENT

FOR DRY LOCATIONS

UNIT TO BE USED ONLY IN SPECIFIED ENVIRONMENTAL CONDITIONS

TEMPERATURE: 15° - 30° C (60° -85° F)

HUMIDITY: 30% - 60% RELATIVE HUMIDITY, NON CONDENSING

### ENTELA CERTIFIED

TO UL2601-1

CAN/CSA601.1, IEC 60601-2-46



The lighthead Data Label contains the lighthead  
model number, bulb type, fuse type, electrical specifications  
and product serial number.

FUSE TYPE	SKYTRON - GRAND RAPIDS, MI			MODEL (CAT. NO.)
	ELECTRIC RATING	CAT. NO.		
	INPUT 120V		60Hz	
	BULBS TYPE	H24501	24V	50W
	SAFETY FUSE		IPX0	CLASS 1
	SERIAL NO.		TYPE B	
	DAI-ICHI SHOMEI CO., LTD. TOKYO, JAPAN			

SERIAL NO.

## SPECIAL USER ATTENTION

As with the operation of any surgical light, all hospital personnel should be aware that a certain amount of care must be exercised to maintain patient safety and to keep your SKYTRON light fixture performing at peak efficiency.

To help assure the highest degree of operating safety for user and patient, SKYTRON has provided precautionary instructions throughout this manual.

All operating room personnel should be familiar not only with the proper operation of the SKYTRON surgical light fixture, but also with the precautionary instructions associated with its proper use.

Please review the following summary of the important precautionary instructions:



### WARNING



Indicates a possibility of personal injury.



### CAUTION



Indicates a possibility of damage to equipment.

### NOTE

Indicates important facts or helpful hints

### NOTE

To prolong bulb life, the soft-start bulb protection circuit will cause a slight delay before the bulbs will illuminate



### WARNING



Be sure sterile handle is properly secured before using the lighthead. An improperly installed handle could fall out, resulting in possible injury to patient or surgical staff.



### WARNING



In the presence of flammable anesthetics, DO NOT allow the lighthead to be below 60 inches from the floor.

### NOTE

SKYTRON products are guaranteed for proper performance with the use of genuine SKYTRON CENTER FOCUS HANDLES. After market competitive handles and other disposable handles will have varying results that could ultimately affect the proper performance and secure engagement of the center focus handle. Such applications are at the discretion of the user to ensure patient safety.

### NOTE

All repairs should be made using only authorized SKYTRON replacement parts.

**CAUTION**

Use of incompatible cleaning agents will cause damage to the fixture. Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethylene glycol, phenol, iodophors, or glutaraldehyde based disinfectants. Staining, pitting, discoloration and diffuser cracking may occur if these are used.

**NOTE**

To extend the life of the bulb reflector surface, it should not be included in normal cleaning. It should be cleaned only if absolutely necessary. Clean gently with a clean, damp, soft cloth and a mild soap solution. NO abrasives.

**WARNING**

Be sure the power is turned "OFF" and the bulbs have cooled before changing.

**WARNING**

DO NOT attempt to remove a bulb by pulling on the glass surface or end cap. This may cause the bulb to break off in your hand.

**CAUTION**

Halogen bulbs are sensitive to body oils. DO NOT handle glass surface of bulb as body oils from your fingers can create a "hot spot" and may cause the bulb to burn out prematurely. This can best be avoided by using the plastic wrapper that the bulb is packaged in or a clean cloth wrapped around the base of the bulb when installing.

## MODEL IDENTIFICATION



**MODEL ST2923**  
1 - 29" Diameter Lighthead  
1 - 23" Diameter Lighthead



**MODEL ST292323**  
1 - 29" Diameter Lighthead  
2 - 23" Diameter Lightheads



**MODEL ST29**  
1 - 29" Diameter Lighthead



**MODEL ST23**  
1 - 23" Diameter Lighthead

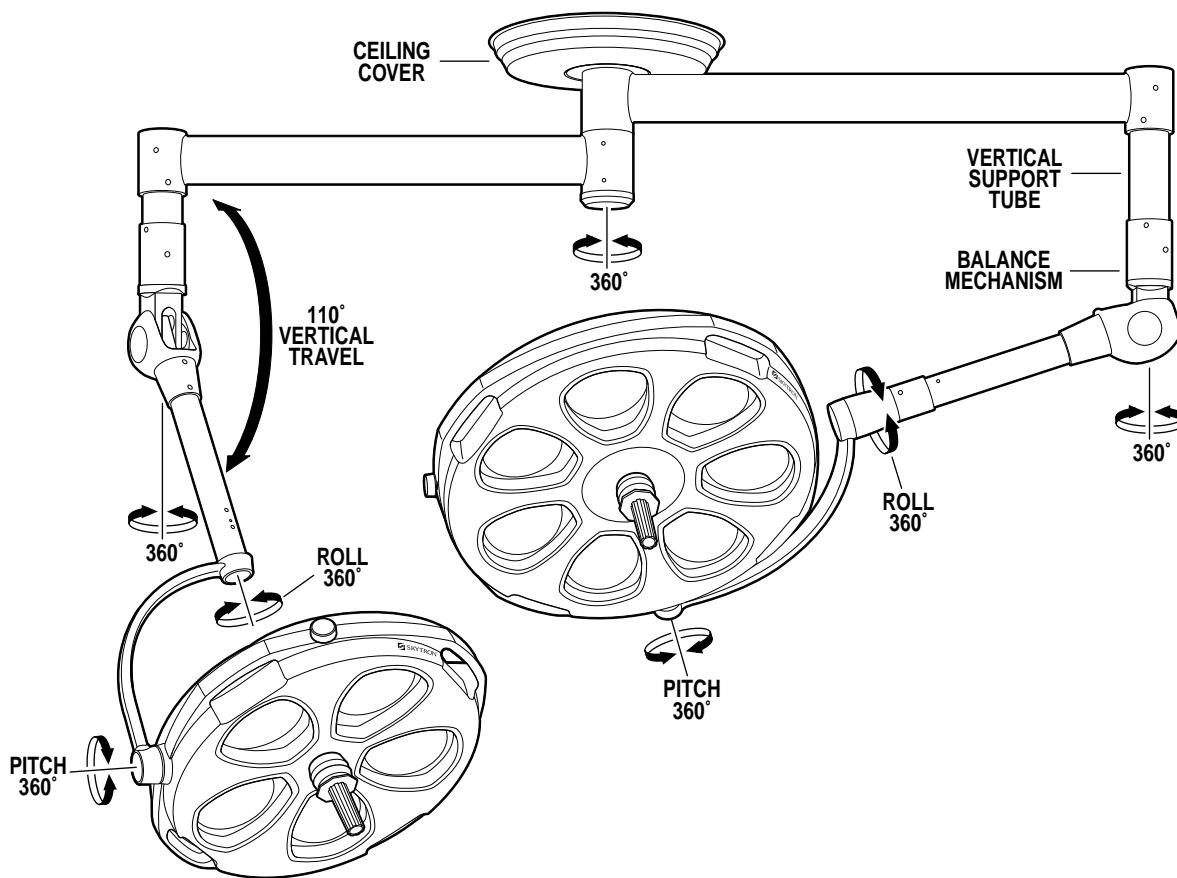


**MODEL ST2323**  
2 - 23" Diameter Lightheads



**MODEL ST232323**  
3 - 23" Diameter Lightheads

## INTRODUCTION



**Figure 1. Light Fixture Rotation Capabilities**

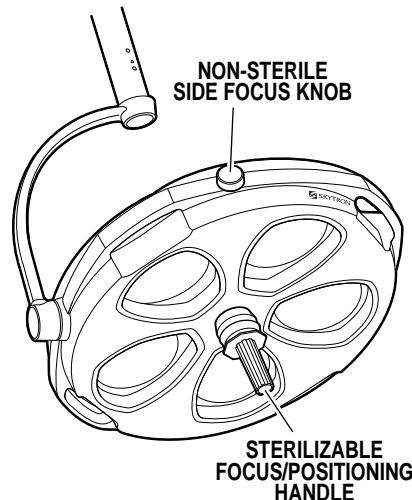
The Stellar series surgical lighting system from SKYTRON features fully adjustable positioning and focus control for its cool, color-corrected, multiple bulb, light source. Combinations of vertical positioning and multiple rotational capabilities allow the single, dual or triple lighthead models virtually limitless positioning within a thirteen foot diameter area (triple lighthead models).

The fixtures are single point ceiling mounted with a continuous 360 degree rotation capability at the ceiling mount end of the radial support arm. See figure 1. The balance mechanism which is attached to the radial arm by a vertical support tube, provides the lighthead an additional continuous 360 degree rotation point. The balance mechanism is an enclosed spring tension system. This allows vertical movement of the lighthead while maintaining the lighthead position without drifting. The yoke provides additional 360 degree rotation points for lighthead pitch and roll.

The Stellar fixtures have a lighthead vertical travel capability of 110°.

The adjustable focus mechanism which optimizes the light output by superimposing all the light beams into a single spot can be operated by non-sterile personnel using the lighthead mounted focus knob.

All lightheads also have a removable, sterilizable, focus/positioning handle. This allows all final positioning and focus adjustments or changes to be precisely done by the surgeon. See figure 2.



**Figure 2. Focus Adjustments**

## BASIC LIGHTHEAD OPERATION

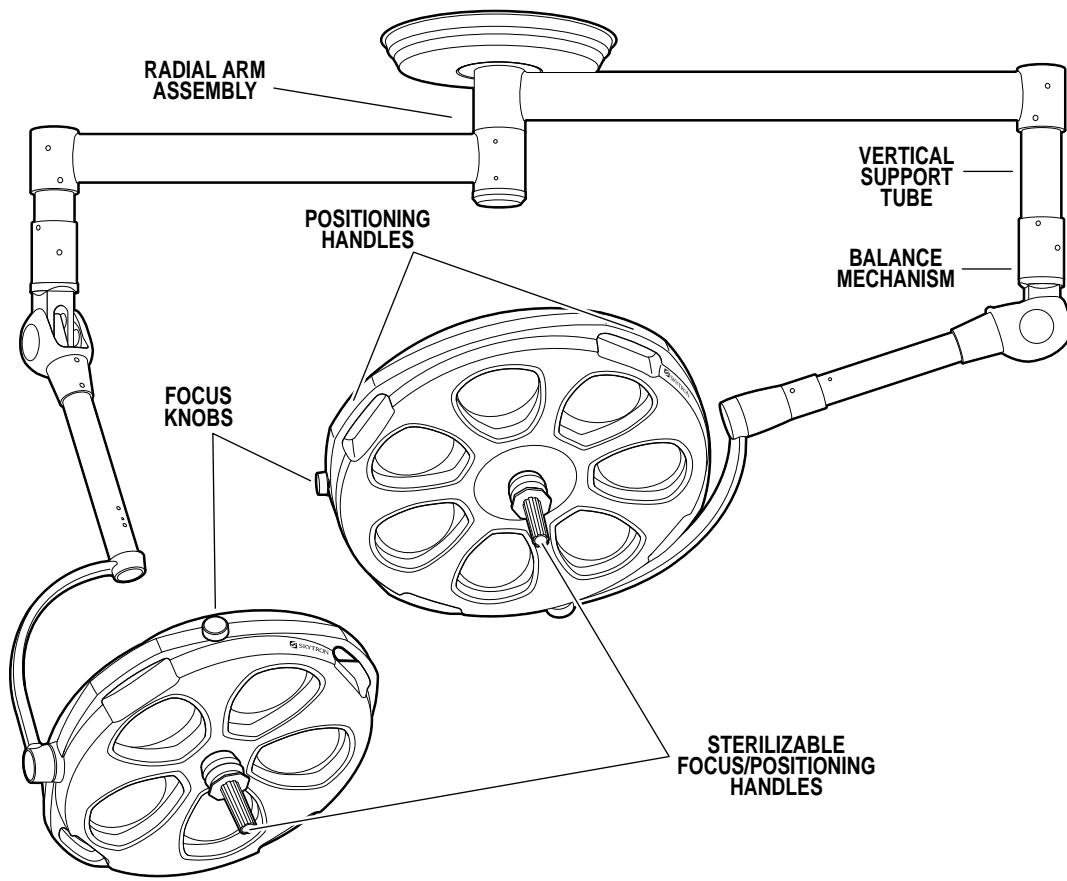


Figure 3. Dual Lighthead Fixture

Use the following instructions to operate the light fixture:

1. Position the lightheads as required by grasping the lighthead positioning handles and moving the lighthead to the desired position. See figure 3.

2. Turn the light fixture main power switch "ON" at the wall mounted control box and select the desired intensity for each lighthead as required. See figure 4. The mid-range position will provide adequate illumination for most procedures. Full intensity will usually only be required for extreme deep cavity cases.

**NOTE**

To prolong bulb life, the soft-start bulb protection circuit will cause a slight delay before the bulbs will illuminate.

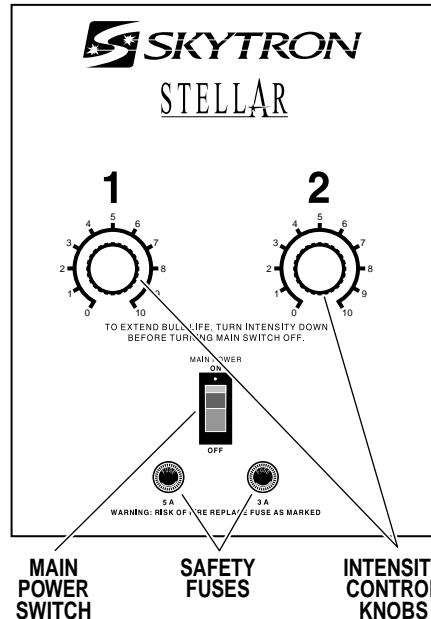


Figure 4. Wall Mounted Control Box

3. When the surgeon is ready to use the light, install the sterilized center focus/positioning handle using the following procedure. See figure 5. Be sure handle is properly secured before using the lighthead. Possible injury to patient or staff could result if a handle is not installed properly.

a. Insert the handle into the lighthead attachment ring.



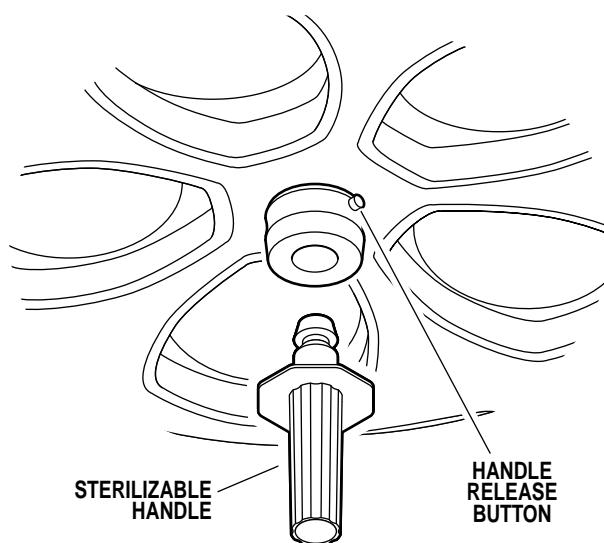
#### **WARNING**



Be sure sterile handle is properly secured before using the lighthead. An improperly installed handle could fall out, resulting in possible injury to patient or surgical staff.

b. Push the handle in, turn it right and left, and pull the handle out to be certain that it is locked (PUSH-TWIST-PULL). A distinct click can be heard when the handle is properly engaged.

c. To remove the handle, push the release button and pull the handle out.



**Figure 5. Center Focus/Positioning Handle Installation**

4. Adjust the focus by moving either the non-sterile focus knob or the (sterilized) center focus handle until all of the light beams converge on the surgical site forming a single bright spot of light.

5. For low angle lighting approach, the lighthead will move 90° below horizontal. Pull the lighthead down by the positioning handles or the (sterile) positioning/focus handle.



#### **WARNING**



In the presence of flammable anesthetics, DO NOT allow the lighthead to travel below 60 inches from the floor.

6. When the light is no longer required, return the lighthead to its full up position. Decrease the intensity at the wall control, and turn the main power switch "OFF".

#### **NOTE**

SKYTRON products are guaranteed for proper performance with the use of genuine SKYTRON CENTER FOCUS HANDLES. After market competitive handles and other disposable handles will have varying results that could ultimately affect the proper performance and secure engagement of the center focus handle. Such applications are at the discretion of the user to ensure patient safety.

## LIGHTHEAD POSITIONING

### General

To obtain the maximum benefit from your SKYTRON surgical lighting system, the following suggestions are offered as a guide for lighthead positioning. Personnel who are trained in proper lighting techniques can plan and set up the lighting arrangements prior to the arrival of the patient. Factors which should be considered when prepositioning surgical lights are:

- Specific procedure to be done
- Patient position during procedure
- Position of surgical team
- Location of instrument trays or tables
- Location of IV stands
- X-ray equipment and personnel
- Anesthesia equipment and personnel
- Angulation and size of surgical cavity

### Surgical Table Placement

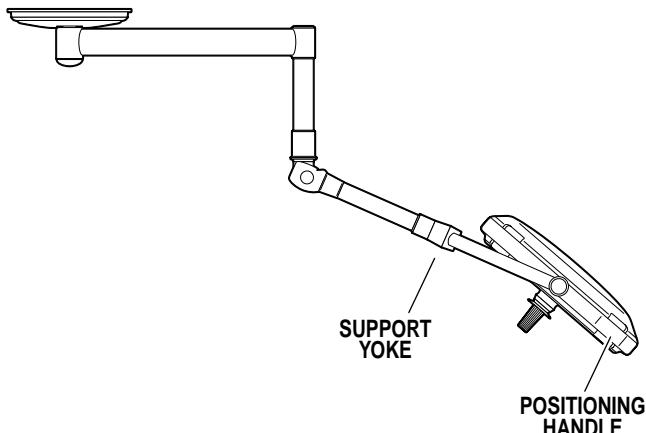
For most procedures the surgical table should be located with its center point directly under the light fixture's ceiling mount.

### Pre-Positioning The Lighthead

Surgical light positioning requirements change not only from procedure to procedure, they also change from surgeon to surgeon. Final light positioning and adjustment will be directed or done directly by the surgeon. The objective of prepositioning is to require a minimum of final adjustments after arrival of the patient. The non-sterile focus control should be located where it can be reached by non-sterile personnel and the sterile positioning/focus handle where they can be reached by the surgeon. Use extreme care when prepositioning lightheads. Bumping lightheads into one another, into walls, or other equipment may alter bulb alignment which affects proper focus adjustment.

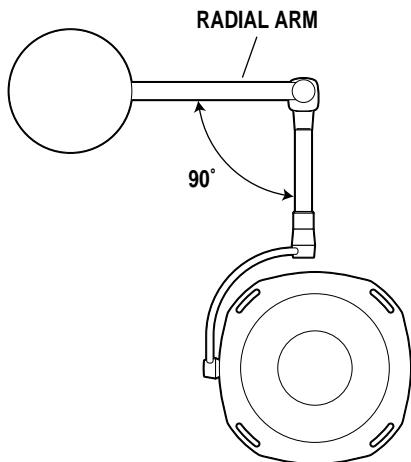
The lightheads can be most effectively positioned by using the following procedures:

1. Grasp the positioning handles on the lighthead and pull the lighthead down to shoulder height. Keep the lighthead at approximately a 45° angle to easily position the support yoke. See figure 6.



**Figure 6.**

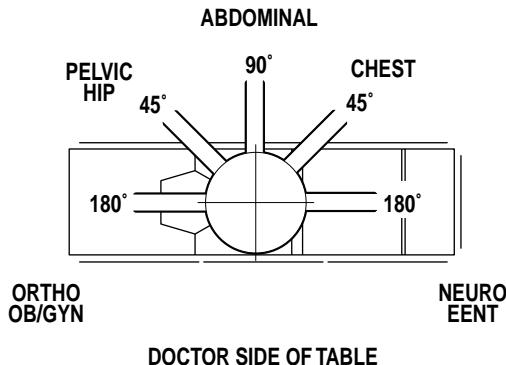
2. Using the positioning handles, rotate the lighthead around the vertical support until the lighthead is at an approximate 90° angle to the radial arm. See figure 7.



**Figure 7.**

3. Place the radial arm in the desired position by pushing or pulling the lighthead by the positioning handles as you walk around the surgical table.

4. Refer to figure 8 to approximate the desired radial arm position for locating the lighthead over the patient.



**Figure 8. Main Lighthead Radial Arm Positioning**

5. With the radial arm in proper position, rotate the lighthead to the desired position and install the sterile positioning/focus handle. Refer to sterile handle installation procedure.

6. Grasp the positioning handles, place the lighthead at an angle and move the lighthead to its full up position.

## ILLUMINATION TECHNIQUE

Maximum illumination, shadow reduction, and possible obstruction by the surgeon or surgical staff are also major concerns for lighthead positioning. The following examples are offered as a basic guide for lighthead placement for large diameter/satellite, dual lighthead, or triple lighthead fixtures.

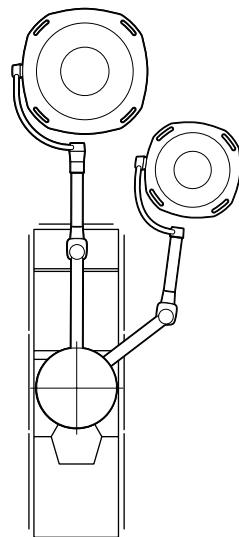
### **Large Diameter/Satellite Lighthead Positioning**

The large diameter lighthead should be pre-positioned over the surgical site. The satellite can be used on either side of the surgeon for augmentation and shadow control.

The large lighthead should be positioned perpendicular to the bottom of the surgical cavity.

### **Head**

To illuminate the head area, position the large diameter lighthead radial arm parallel to the table centerline. See figure 9. Position the lighthead behind the surgeon. Tilt the lighthead to the desired position using pitch axis movement. This will allow the multiple light sources of the lighthead to pass around the head and shoulders of the surgeon and at the same time permit adequate head clearance for the surgeon.



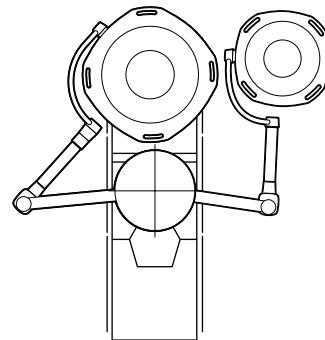
**Figure 9.**

Tilt the lighthead to position the focus control knob where it can be easily reached by non-sterile personnel.

Position the satellite to the left or right according to surgeon preference. This allows a second light source to come from another angle which will help eliminate obstructions or shadows.

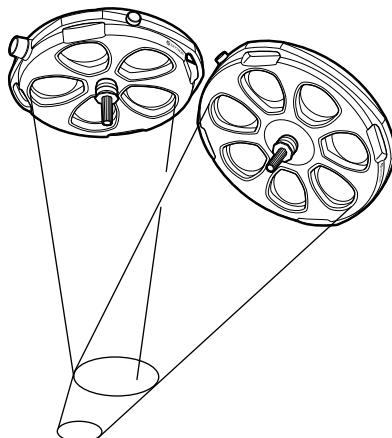
### **Torso Area**

For most chest and abdominal procedures, position the large lighthead directly over the surgical site. See figure 10. Position the radial arm on approximately a 45° angle from the surgical table centerline. This position will locate the sterile focus/positioning handle on the lighthead where it can easily be reached by the surgeon. The focus control will be where it can easily be reached by non-sterile personnel. Position the satellite lighthead, depending on lighting needs, to augment the larger lighthead.



**Figure 10.**

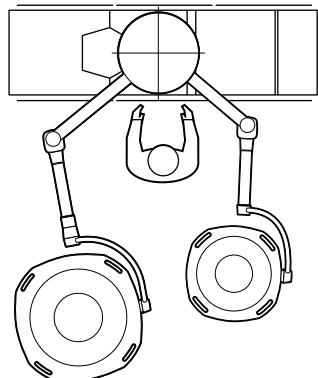
In some cases such as cholecystectomies and total abdominal hysterectomies, the surgical cavity may be angled. In cases such as this, the large lighthead should be angled so that the face of the lighthead is perpendicular to the bottom of the surgical cavity. See figure 11.



**Figure 11.**

## Dual 23" Diameter Lighthead Positioning

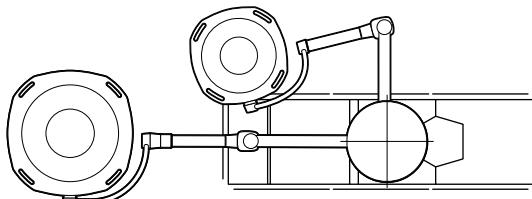
Some procedures, such as hip pinnings, require both lightheads to be on the same side of the table. See figure 12. In this position the lightheads are behind and adjusted to project light over the head and shoulders of the surgeon. Both lightheads are easily reached for adjustment by non-sterile personnel.



**Figure 12.**

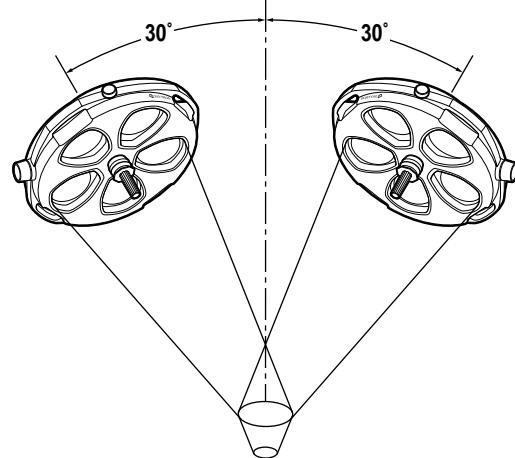
## Perineum

The large diameter lighthead should be positioned at the end of the table for perineal procedures. Locate the radial arm directly in line with the centerline of the table. Once the surgeon has assumed a seated position, the lighthead can be pulled down, angled, and adjusted to provide the necessary illumination over the surgeon's head and shoulders. See figure 13. The satellite lighthead radial arm should be positioned approximately 90° from the other radial arm. Position the satellite lighthead to the right or left of the large lighthead according to surgeon preference. In this position, the focus knobs of both lightheads are located for easy reach by non-sterile personnel.



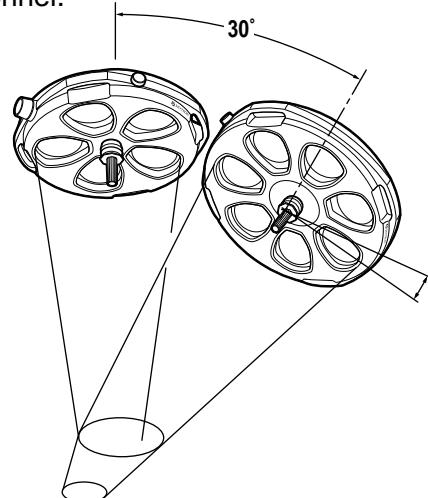
**Figure 13.**

Fixtures containing dual 23" diameter lightheads require some special positioning considerations. The small diameter of the lightheads allows the light source to be more easily obstructed by the surgical staff. It is very important that the surgical site remain illuminated even though the head and hands of the surgeon and the surgical staff may be directly in the central light beam path. In order to minimize shadowing, the lightheads should be positioned so that their light beams are angled into the surgical cavity. Regardless of the surgical site, these lights should be positioned to maintain an angle of approximately 30° about an imaginary line running perpendicular to the bottom of the surgical site. See figure 14.



**Figure 14.**

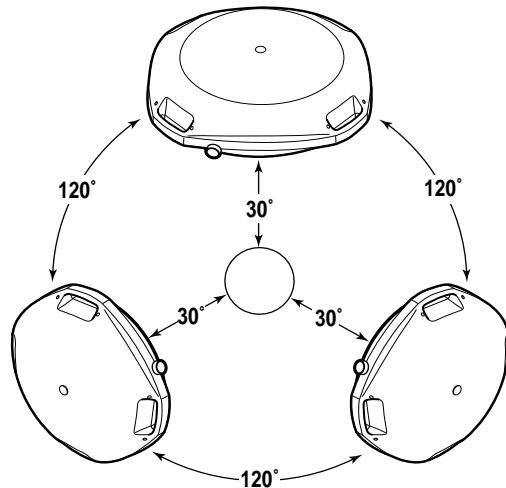
Tilting the lightheads will give a larger light beam angle. See figure 15. Final positioning and focus adjustments can be done by the surgeon using the sterile focus/positioning handles. Focus controls should be positioned where easily reached by non-sterile personnel.



**Figure 15.**

## Triple Lighthead Positioning

Triple lighthead systems will either consist of a large diameter lighthead with two 23" satellites or three 23" lightheads. There are two basic positioning strategies that can be used to obtain the best illumination possible. The first is to align all three lightheads to the centerline of the table with the large lighthead directly over the center of the surgical site. The second is to cluster the lights in a circular arrangement over the surgical site with each lighthead about 120° away from each other. The whole cluster should be positioned to minimize interference with the head and shoulders of the surgical staff. See figure 16.



**Figure 16.**

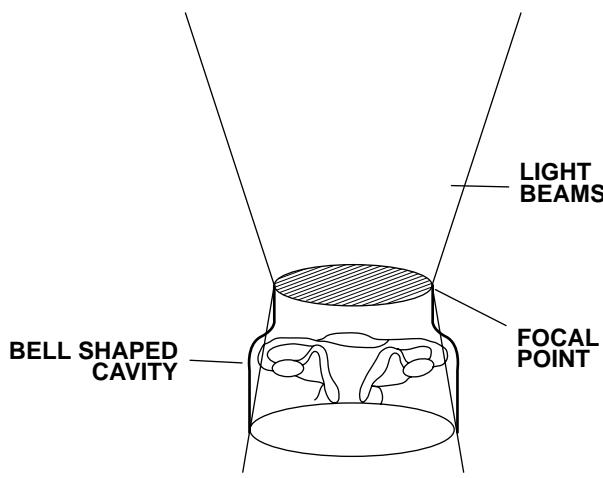
When an angled cavity is to be illuminated, at least one of the lightheads should be positioned to be perpendicular to the bottom of the cavity.

For head and perineal work, the lights should be positioned as they would for a dual system but with a satellite on each side of the surgeon.

## Bell-Shaped Cavities

For most surgical procedures the lighthead will be properly focused with all the light beams converged in one spot at the bottom of the surgical cavity.

However, in the case of a bell-shaped cavity (for example - total abdominal hysterectomy on an obese patient), focusing at the bottom of the cavity may cause more shadow problems. The focal point for the light beams should be above the bottom of the cavity. See figure 17.



**Figure 17.**

Beyond the focal point, the light beams spread out like an inverted cone and will more evenly spread the light throughout the bell-shaped cavity.

## Other Illumination Considerations

Close attention to surgical light intensity during the case as well as good quality general illumination in the room will help to minimize eye fatigue of surgical personnel.

Dark surgical drapes will help to reduce reflectance. White drapes should be avoided at all times because of high reflectance.

The use of matte and satin finish instruments and retractors also helps to reduce eye fatigue.

**General**

To insure proper operation and to extend the life of your SKYTRON surgical lighting system, the following preventive maintenance procedures are recommended.

**MAINTENANCE****NOTE**

All repairs should be made using only authorized SKYTRON replacement parts.

**Daily Maintenance**

Daily or between cases, the lighthead exterior should be wiped down with a mild cleaning agent which will not affect the painted or acrylic parts. Do not apply or spray cleaning agents directly on the lighthead.

**CAUTION**

Use of incompatible cleaning agents will cause damage to the fixture. Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethylene glycol, phenol, iodophors, or glutaraldehyde based disinfectants. Staining, pitting, discoloration and diffuser cracking may occur if these are used.

- Use plexiglass cleaners, DO NOT use alcohol based cleaners on the acrylic diffusers.
- Always consult with the manufacturer of the cleaning agent for proper application and use. Always spot test on an inconspicuous area before use.
- Avoid personal injury. Do not attempt to clean lighthead unless power is turned off at wall control and fixture has sufficiently cooled.

- Avoid using excessive amounts of spray cleaners near top cover vents. Leakage of fluids into the interior of lighthead may cause corrosion of electrical components.

- Periodically the filter/diffuser assemblies should be removed and dusted with a clean cloth or washed and air dried as a complete assembly.

- DO NOT operate lights without the filter/diffuser assemblies in place.

**Sterilization**

Recommended sterilization parameters for sterilizable handle:

- a. Prevac, 270° F, 4 minutes
- b. Gravity, 250° F, 30 minutes
- c. Flash, 270° F, 3 minutes

Always consult current AORN journal recommendations for proper sterilization procedures.

**Adjustments**

As part of a regular preventive maintenance program, it is suggested that a check of the various positioning axes be made to verify correctness of tension adjustment. If any lighthead drift is noticed, all that is usually necessary is a minor adjustment. Readjustment should be made as per the appropriate instructions contained in the Maintenance and Adjustment Manual. Also, during a scheduled cleaning of the lighthead interior, lubrication of the various moving parts is desirable.

## Bulb Changing

Since SKYTRON Surgical Lights contain multiple bulbs, it would not normally be necessary to change a burned out bulb during a surgical procedure. The loss of one or even three bulbs in a large diameter lighthead may be completely unnoticed during use.

To replace a bulb, use the following procedure:

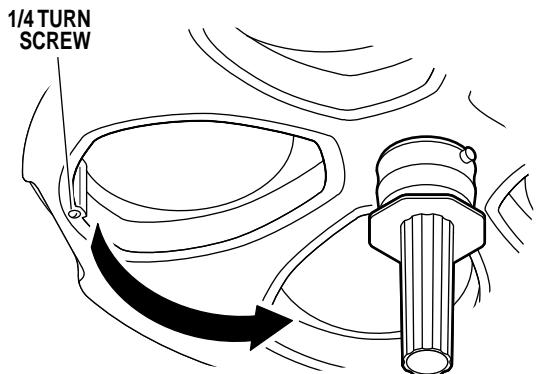


**WARNING**



Be sure the power is turned "OFF" and the bulb has cooled before changing.

1. Hold the diffuser/filter assembly with one hand, loosen the "1/4-turn" screw and lower the diffuser/filter assembly. See figure 18.



**Figure 18.**

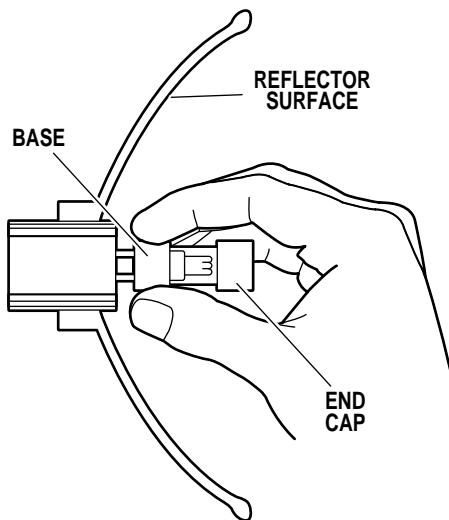


**WARNING**



DO NOT attempt to remove the bulb by pulling on the glass surface or end cap. This may cause the bulb to break off in your hand.

2. Using caution not to touch the reflector surface, hold the bulb by the base and pull it out. See figure 19. Slightly working the bulb back and forth may aid in bulb removal.



**Figure 19.**

**CAUTION**

Halogen bulbs are sensitive to body oils. DO NOT handle the glass surface of the bulbs as body oils from your fingers can create a "hot spot" and may cause the bulb to burn out prematurely. This can best be avoided by using the plastic wrapper that the bulb is packaged in or a clean cloth wrapped around the base of the bulb when installing.

3. Holding the bulb by the base, plug it directly into the socket. Do not touch the glass portion of the bulb reflector surface with your fingers. This can best be done by using the plastic wrapper that the bulb is packaged in or a clean cloth wrapped around the base of the bulb when installing. Be sure bulb base is properly seated in the connector to insure proper focus alignment.

**NOTE**

To extend the life of the bulb reflector surface, it should not be included in normal cleaning. It should be cleaned only if absolutely necessary. Clean gently with a clean, damp, soft cloth and a mild soap solution. NO abrasives.

4. Replace the diffuser/filter assembly by placing the tab into the lighthead face. Place the assembly in position and secure it with the "1/4-turn" screw.

A regular program of preventive maintenance will increase the life of your equipment and keep it operating at peak performance.

Maintenance can be performed by authorized, trained maintenance personnel using SKYTRON authorized replacement parts and service techniques. Service instructions and parts are available from SKYTRON.

Preventive Maintenance contracts are available through your local SKYTRON representative.

To obtain service instructions, replacement parts, factory service or preventive maintenance contracts, contact the SKYTRON representative listed below.

Or contact:

**SKYTRON**

**5000 36th Street S.E.**

**Grand Rapids, MI 49512**

**1-800-SKYTRON (1-800-759-8766)**

**Fax. 1-616-957-5053**



## SKYTRON SURGICAL LIGHTS AND TABLES LIMITED WARRANTY

**Limited Warranty.** SKYTRON, a Division of the KMW Group, Inc., warrants only to the original purchaser (the "Customer") that the products that it sells, either directly or through its distributors or other authorized representatives, shall not be "defective" for the applicable time provided for, and subject to the conditions and exceptions stated in, this warranty. A product shall be considered "defective" if SKYTRON determines that it is defective in materials or workmanship and that the defect materially impairs the value of the product under normal use, maintenance and service. This warranty does not apply to (i) any product that is modified or altered, (ii) minor product adjustments necessitated by ordinary wear and tear or (iii) damage to the products caused by accident, use of replacement parts other than original OEM parts, unauthorized repairs, improper installation or use, abuse, lack of user training, or failure to comply with SKYTRON's instructions. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE.

**Warranty Period.** The warranty on replacement parts, spares, bulbs (for surgical lights), pads and accessory items (for surgical tables) shall extend for 90 days from the date of receipt by the Customer. The warranty on all SKYTRON Surgical Lights and Tables shall extend for two years from (i) the initial installation of the product by Customer or (ii) the first anniversary of the date of shipment to the Customer, whichever is earlier. If SKYTRON supplies a replacement part or product under this warranty, then the warranty on such replacement part or product shall terminate upon (i) 90 days or (ii) the end of the remaining period of the original warranty, whichever is of greater benefit to the Customer.

**Remedies.** If a product proves defective during the applicable warranty period, and if the Customer gives SKYTRON and the distributor from whom the Customer purchased the product written notice of the defect within such period and complies with all other terms of this warranty, then SKYTRON or its authorized service agent shall repair or replace the defective product or part thereof, at SKYTRON's option. If necessary, this warranty includes the cost of service labor and travel time to the site of product use for two years; provided, however, that delays caused by the Customer in accessing the product for repair will be chargeable to the Customer at SKYTRON's authorized service representative's normal hourly rate. If SKYTRON (or its authorized representative) fails to repair or replace any defective product or part thereof within a reasonable time, then SKYTRON shall be liable for the reasonable cost of repair by a third party, but the Customer shall not obtain repair by a third party without giving SKYTRON at least 15 days prior written notice, during which time SKYTRON (or its authorized representative) may repair or replace the defective product or part thereof. This is the sole and exclusive remedy for any defect.

**Limitations.** SKYTRON SHALL NOT BE LIABLE TO THE CUSTOMER OR TO ANYONE ELSE FOR CONSEQUENTIAL, INCIDENTAL, SPECIAL, EXEMPLARY, INDIRECT, OR PUNITIVE DAMAGES ARISING FROM ANY DEFECT, DELAY, NONDELIVERY, RECALL, OR OTHER BREACH BY SKYTRON, INCLUDING, BUT NOT LIMITED TO, PERSONAL INJURY, DEATH, PROPERTY DAMAGE, LOST PROFITS, OR OTHER ECONOMIC INJURY. SKYTRON shall not be liable to the Customer or anyone else in tort for any negligent design or manufacture of any products, or for the omission of any warning with respect thereto.

**Miscellaneous.** No dealer, employee, or other representative of SKYTRON may extend or enlarge this warranty, waive any of the limitations, or make any different or additional warranties with respect to the products. Any statements to the contrary are null and void unless made in writing signed by an authorized officer of SKYTRON. This warranty shall be governed by Michigan law. Any action arising out of or relating to this warranty shall be brought in any federal or state court located in Kent County, Michigan and having jurisdiction of the subject matter, and any such court shall have personal jurisdiction over the parties and the parties waive any objection that the court is an inconvenient forum.





